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INTEREST RATE POLICIES AND BORROWING COSTS IN RURAL FINANCIAL MARKETS: A CASE STUDY

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Abstract

Hidden costs are an important feature of credit transactions in rural financial markets of lesser developed countries. There is frequently a trade-off between explicit interest charges and implicit borrowing costs such that smaller borrowers experience relatively greater borrowing costs than larger borrowers in a low, subsidized interest setting.

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The purpose of this paper is to investigate the nature and dimension of borrowing costs imposed by lenders on agricultural borrowers in an environment of controlled and fragmented interest rates for loans; targeting or end-use requirements imposed by governmental authorities or international donors, and specialized lending institutions dealing with agricultural credit.

Credit allocation by lenders can be done in terms of price setting or loan rate differentiation determined by the riskiness of the loan (Stiglitz and Weiss, 1981; Sealey, 1980). Typically there are constraints on price setting and loan rate differentiation in the institutional milieu of rural financial markets in lesser developed countries (LDCs). These markets are frequently the scene of policy actions targeting credit flows to specified groups at concessionary interest rates (Adams and Graham, 1981).

In this setting lenders, in facing constraints on price setting or loan rate differentiation, are induced into regulatory avoidance or implicit price setting (Kane, 1981). This involves different procedures for credit allocation, monitoring and

supervision that create both lender and borrower transactions costs (Adams and Graham, 1981; Ladman, 1981). This in effect amounts to exercising price setting through the non-interest component of the price vector. Thus lenders engage in a discriminatory application of loan procedures among borrowers. This enables them to ration out unwanted clients and keep (or ration in) desired clients. The lender can transfer the burden of transaction costs from himself to the borrower in the form of administrative charges, fees, documentation requirements and charges, compensatory balances, etc.

In the study that follows we shall be investigating field survey results that show how agricultural lenders in Honduras have in practice adjusted their credit procedures to allocate credit in the context of various end-use requirements and a limited range of interest rates within which they were able to operate. We shall see to what extent they in fact transferred borrowing costs to borrowers according to selected features of the loan operating as proxies for risk.

The Model and Empirical Results

A general formulation of the model used in this study is as follows: $T = T(B,i)$ (1)

where: T is the borrowing transaction costs

B is a vector of risk-related characteristics of the loan operation (loan size, farm size, end-use, etc.)

i is the explicit interest rate that can be charged on loans.

Transaction costs are defined here as all those non-interest explicit and implicit expenses incurred by the borrower in the process of obtaining a loan. These costs occur at different stages of the sequence of procedures established by the lending institutions, in general: application and documentation, approval, and disbursement. Explicit expenses refer basically to the following:

(a) Cost of transportation, lodging and meals when travelling to the office of the institution granting the loan, or to other places with the purpose of obtaining related documents.

(b) Fees, taxes or other charges associated with the issuing of documents, registration of guarantees or collateral, contracts and the like.

(c) Explicit charges imposed by the lending institutions in the process of handling the application.

The implicit transaction costs directly related to the borrowing considered here correspond to the value of the time foregone by farmers attributable to negotiating and securing their loan.

We argue that lenders are price-setters (of explicit and implicit interest charges) that take as given the profile of characteristics of total loan demand such as farm size, loan amounts demanded, enterprise type, characteristics of the borrowers, etc. They then set explicit interest charges and, more importantly here, establish differential administrative procedures that are in

effect transformed into implicit charges (i.e. transaction costs for the borrower) according to these loan demand characteristics.

Components of B in the general formulation above refer to those proxies associated with risk. The key elements here from the point of view of the lender are farm size (associated with farm wealth and the capacity for loan recovery); the loan amount (the larger the amount the greater the risk); and loan use (enterprise type characteristics associated with different levels of farming risks, marketing risks, built in collateral, etc.)

Data utilized in our field study came from a random sample of farm level clients of selected lenders in Honduras. The survey was undertaken in August 1981 and consisted of a total of 198 farmer-clients of which 104 had loans from the National Agricultural Development Bank (BANADESA), 52 had loans from private commercial banks and 42 had received credit from small rural credit unions. Approximately one half of the total sample of farm borrowers had loans less than 5,000 lempiras (i.e. $2,500 at the current exchange rate of two lempiras equal to one dollar). The average loan size however was close to 23,000 lempiras indicating a clear asymmetry or skewness in the overall distribution of loans.

Although the distribution of the clientele for each loan source overlaps to some extent, each can be clearly identified with respect to the predominant scope of their operations in terms of loan and farm size. Rural credit unions in Honduras are the classic small farmer loan source with most loans below

2,000 lempiras in size on farms typically less than 20 hectares. At the other extreme are the farmer-clients of the private commercial banks with the larger proportion of their loans over 25,000 lempiras on farms generally above 100 hectares. The national agricultural development bank (BANADESA) activity falls in between with a majority of its loan operations between 1,000 and 10,000 lempiras on farms largely between 10 and 100 hectares.

The aggregate results for the sample as a whole indicates that the various elements of borrowing or transactions costs added roughly three percentage points to the average explicit interest rate of 13 percent. This represents almost one quarter of the interest rate. More importantly however is the incidence of these borrowing costs by loan and farm size in the sample. Table 1, panels A and B, highlight the results of transactions or borrowing costs per loan and per lempira. Transactions costs per loan are positively related to both loan and farm size, however, when one takes into account the size of the loan it can be seen that transactions costs per lempira are negatively related to both loan and farm size. In short the smaller the farm and the smaller the loan, the greater the relative importance of transactions costs per lempira.

Multiple Regression Model and Results

A more rigorous formal estimation of the determinants of total transaction costs was undertaken using a power function specification for the variables in the model.

Table 1. Borrowing Costs per Loan and per Lempira by Farm Size and Loan Size.

Panel A. Borrowing Costs, by Farm Size[1/]

Farm Size Category (Has.)	Transaction Costs Per Loan (Lps.)	Interest Rate (%)	Total Borrowing Costs Per Lempira (%) Approved	Disbursed
Less than 5	31.75	13	16.0	17.33
5.1 - 10	40.0	13	15.07	17.14
10.1 - 20	53.5	13	16.20	17.67
20.1 - 50	56.25	13	14.64	15.52
50.1 - 100	75.0	13	14.84	15.64
100.1 - 200	133.75	13.5	16.52	17.52
More than 200	149.25	13	13.82	14.02

Panel B. Borrowing Costs, by Loan Size[1/]

Loan Size Category (Lps.)	Transaction Costs Per Loan (Lps.)	Interest Rate (%)	Total Borrowing Costs Per Lempira (%) Approved	Disbursed
Less than 1,000	30.75	13	18.92	19.23
1,001 - 2,000	42.0	13	16.07	17.73
2,001 - 5,000	44.88	13	14.88	15.77
5,001 - 10,000	53.0	13	14.03	14.94
10,001 - 15,000	86.75	13	14.56	14.87
15,001 - 25,000	42.75	13.5	13.89	14.35
25,001 - 50,000	131.50	14	14.40	15.71
50,001 - 100,000	322.50	13	13.17	13.63
More than 100,000	1,414.50	11	12.09	12.36

[1/] All values are median values. Therefore, the median values of total borrowing costs are not necessarily the sum of the median values of the separate transaction costs per lempira plus the median value of the interest rate, as they would be if mean values had been used.

Source: Survey results.

This specification was chosen in order to directly estimate the elasticities of transactions costs with respect to the proxies for loan risk and the explicit interest rate. At the same time the per lempira specification allows us to correct for any potential problem of heteroskedasticity.

The form of this specification is as follows:

$$T = \alpha A^{\beta} L^{\gamma} (i)^{\delta} e^{Z} \quad (2)$$

and $$t = \alpha A^{\beta} L^{(\gamma-1)} (i)^{\delta} e^{Z} \quad (3)$$

where $t = \frac{T}{L}$ (i.e. transactions cost per lempira).

and T = transactions cost per loan in lempiras.

A = farm size in hectares

L = approved loan amount in lempiras

i = the explicit interest rate

e = the base of the natural log

$$Z = a_1 D_1 + a_2 D_2 + b_1 U_1 + b_2 U_2 + b_3 U_3$$

with D_1 and D_2 dummy variables representing deviations of T in private banks and credit unions with respect to BANADESA, the base or level of reference; and U_1, U_2 and U_3 being dummy variables defined to handle the deviations due to enterprise type or end-use of the loan in basic grains U_1, export crops U_2, and livestock U_3, with respect to the miscellaneous end-use category of all other end-uses in agriculture (land purchases, trade, vegetable crops, etc.).

The results of the ordinary least squares estimation for the log linear transformation of equation (2) are presented in columns 1, 2 and 3 in Table 2. Those corresponding to equation (3) are presented in columns 4, 5, and 6 of the same table. The signs, the magnitude and significance level of all coefficients are as expected in our previous discussion.

Table 2. Regression Analysis of Transaction Costs Per Loan and Transaction Costs Per Lempira. Estimated Coefficients in Different Regressions.[1/]

Explanatory Variables	Transaction Costs Per Loan Equations			Transaction Costs per Lempira Equations		
	1	2	3	4	5	6
Area of the Farm	0.0758 (1.01)	0.0001 (0.0)		0.0758 (1.01)	0.0001 (0.0)	
Loan Amount	0.2621 (3.14)[a]	0.3387 (3.84)[a]	0.3658 (5.30)[a]	- 0.7378 (-8.84)[a]	- 0.6612 (-7.50)[a]	- 0.6342 (-9.19)[a]
Interest Rate[2/]	- 1.0781 (-4.47)[a]	- 0.9237 (-3.78)[a]	- 0.8662 (-3.63)[a]	- 1.0781 (-4.47)[a]	- 0.9237 (-3.78)[a]	- 0.8662 (-3.63)[a]
Loan Source:						
Private Banks	0.54 (2.20)[b]	0.59 (2.20)[b]	0.50 (1.93)[b]	0.54 (2.20)[b]	0.59 (2.20)[b]	0.50 (1.93)[b]
Credit Unions	- 1.02 (-4.47)[a]	- 0.83 (-3.11)[a]	- 0.83 (-3.23)[a]	- 1.02 (-4.47)[a]	- 0.83 (-3.11)[a]	- 0.83 (-3.23)[a]
Loan Use:						
Basic Grains		0.36 (1.36)	0.34 (1.36)		0.36 (1.36)	0.34 (1.36)
Export Crops		- 0.34 (-1.09)	- 0.38 (-1.28)		- 0.34 (-1.09)	- 0.38 (-1.28)
Livestock		0.49 (1.50)	0.45 (1.48)		0.49 (1.50)	0.45 (1.48)
Intercept	4.47 (5.01)[a]	3.42 (3.40)[a]	3.09 (3.32)[a]	9.07 (10.17)[a]	8.03 (7.97)[a]	7.69 (8.27)[a]
R-Square	0.43	0.47	0.46	0.46	0.49	0.48
F Value	26.66[a]	18.81[a]	22.20[a]	29.69[a]	20.80[a]	23.46[a]

[1/] t-statistics in parentheses. Significance levels: a, 0.01; b, 0.05.

[2/] t-statistics for the hypothesis $\delta=-1$ were computed with the following results: eq. 4: -0.3237; eq. 5: 0.3124; eq. 6: 0.5609. Therefore the hypothesis is not rejected in any of these cases.

Among the more relevant findings is the fact that farm size is not significant. Dropping this variable from the equation does not change the overall significance and in the end simplifies the specification. Another finding here is that transaction costs per loan are an increasing function of loan size. This can be seen in Figure 1 where our findings are portrayed for reference. This finding contradicts the assumption made in some studies (e.g. Ladman, 1981) that transaction costs are independent of loan size. The behavior of these costs with respect to loan size highlights the cost economies evident in making larger sized loans. The elasticity of transaction or borrowing costs with respect to loan size is less than one (it ranges from 0.26 to 0.37 in Table 2) while the level of the explicit interest rate is a shift parameter in this relationship as can be seen in Figure 1.

In the light of these findings we can also see that transaction costs per lempira is a monotonically decreasing function of loan size with the explicit interest rate as a shift parameter as seen in Figure 2. In other words, for a given loan size an increase in the interest rate that lenders charge would lead to a reduction of transactions costs per lempira.

The most interesting finding emerging from this sample data is that the elasticity of t, transaction costs per lempira, with respect to the explicit nominal interest rate is not statistically different from minus one; the range of values obtained is -0.8662 through -1.0761 and the tests performed on these estimates indicate we cannot reject the hypothesis that the elasticity is minus one. This means that t and i are perfect substitutes for each

Figure 1. Transaction Costs per Loan (T) and Loan Size (L), for Different Levels of Interest Rate (i).

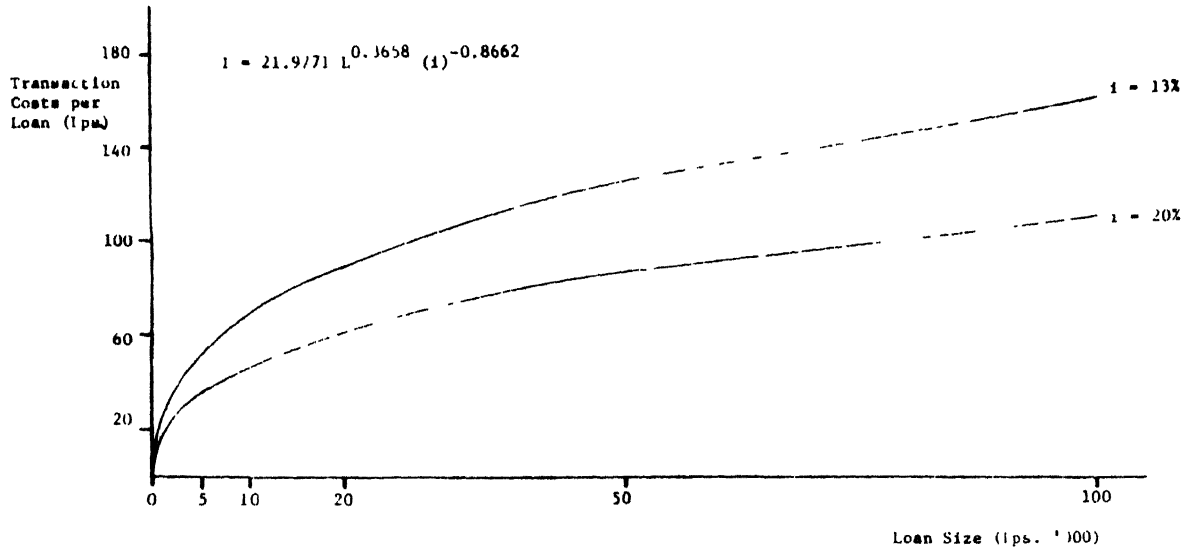
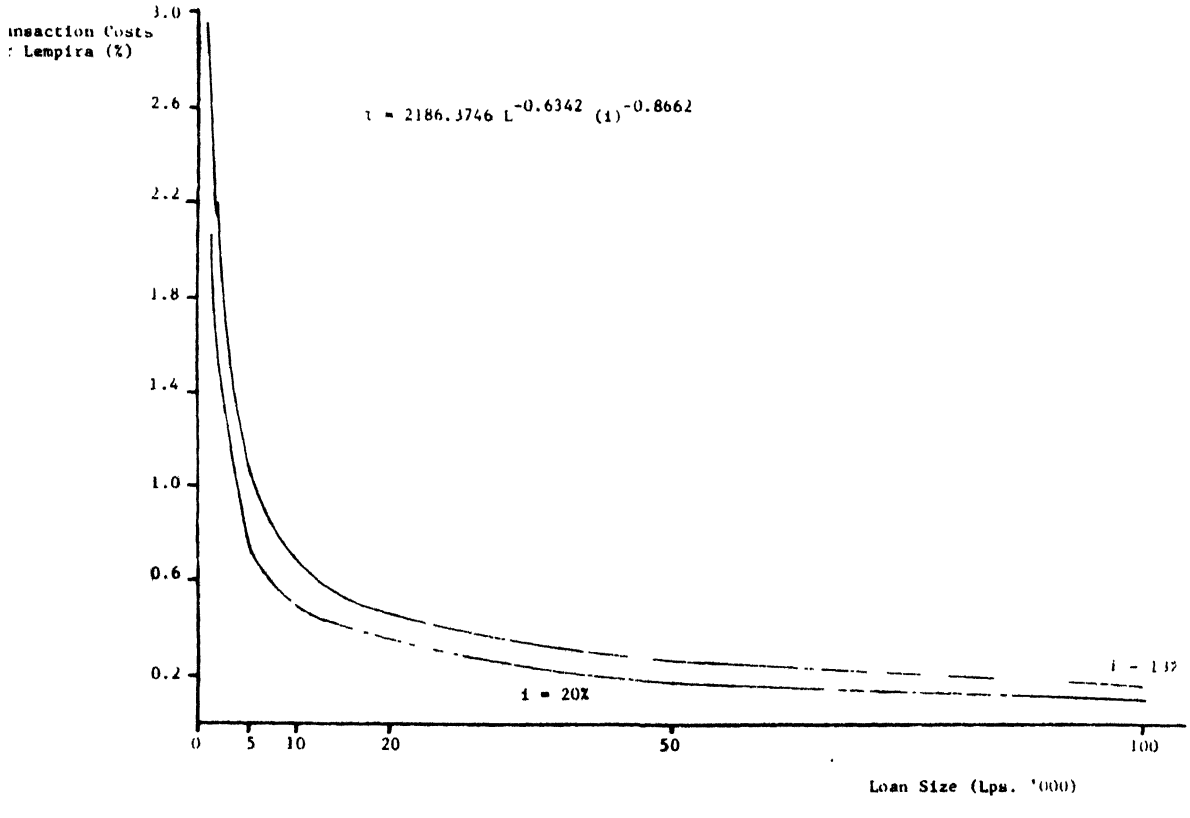


Figure 2. Transaction Costs per Lempira (t) and Loan Size (L), for Different Levels of Interest Rate (i)



other. A one percent increase in the explicit interest rate leads to a one percent decline in transaction costs per lempira.

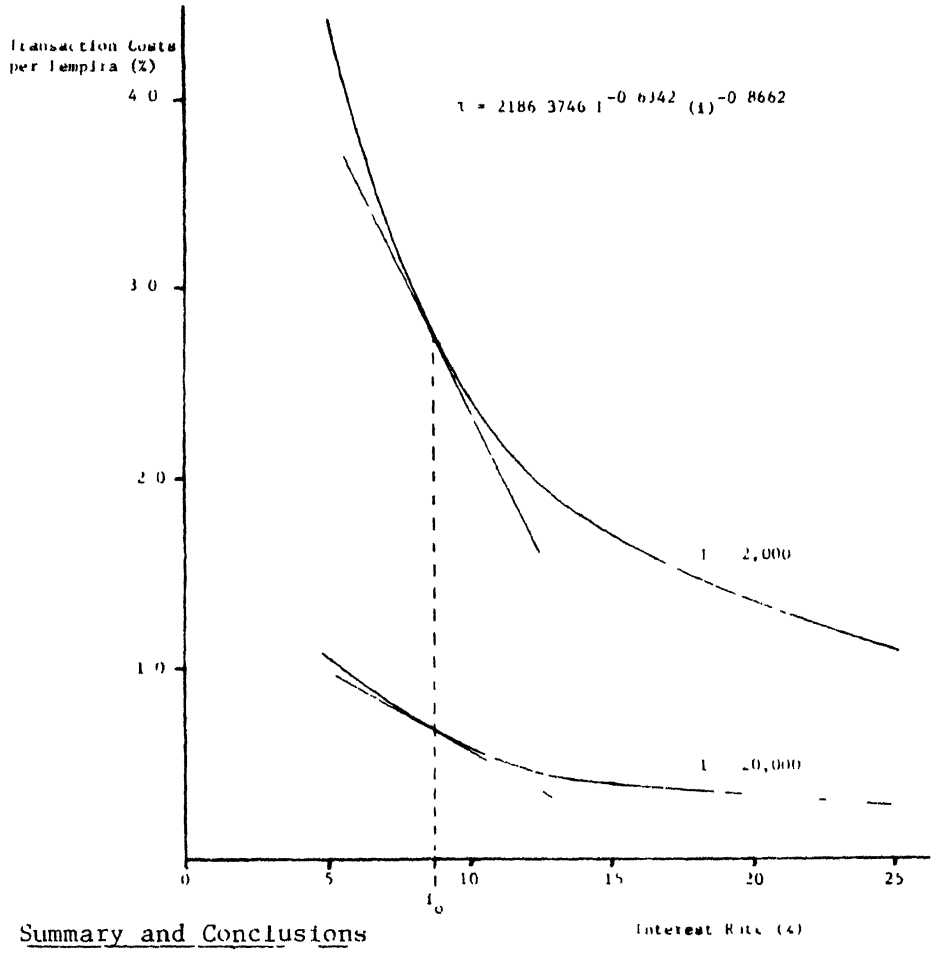
An additional finding here is that this elasticity of t to changes in i has a differential impact on the borrowing costs of different loan sizes. Figure 3 illustrates this point where loan size is the shift parameter in this diagram. The curve shifts downward (towards the origin) when loan size increases and upward (away from the origin)when the loan size decreases. At a given explicit interest rate i_o, a change in i will create a larger absolute change in the opposite direction in average transaction cost per lempira for smaller loans than for larger loans (see Figure 3).

This result implies that a rise in the explicit interest rate will create a relatively more progressive or equitable result in that this increase will reduce the absolute borrowing or transactions costs per lempira for smaller sized loans relatively more than for larger sized loans. An illustration of the change in overall borrowing costs (t+i) brought about by a change in the explicit interest rate (i) can be seen below:

Loan Size (in lempiras)	d(t+i)/di
1,000	0.80
5,300 (median value in the sample)	.93
100,000	.99

Thus a one point increase in the interest rate will create 0.8 of a point increase in total borrowing costs for a loan size of 1,000 lempiras and 0.99 of a point increase for 100,000 lempiras. The offsetting decline in non-interest borrowing or transactions cost is stronger for smaller sized loans.

Figure 3. Transaction Costs per Lempira (t) and Interest Rate (i), for Different Loan Sizes (L)



Summary and Conclusions

The issue of non-interest borrowing costs is an important feature of rural financial markets. This study illustrates how implicit borrowing costs in Honduras are significantly associated with loan size and borrowing costs per lempira a substitute for interest charges. It was found there was a differential incidence of borrowing costs by loan size such that a rise in the interest rate would have a greater relative effect in increasing total borrowing costs for larger than smaller loans and, conversely, a decline in interest rates would lower total borrowing costs relatively more for larger than smaller loan sizes. Subsidized credit programs therefore may have an inequitable effect on borrowers by loan size.

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